SCIENCE & GOVERNMENT REPORT

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Science Indicators: A New Portrait of US Research

For students of the state of American science, the publication to get is *Science Indicators 1976,* a 304-page statistical behemoth overflowing with data — vital as well as trivial — on virtually every measurable aspect of the national research enterprise.

(Available for $4.75 per copy from the US Government Printing Office, Washington, DC 20402. Order by Stock Number 038-000-00341-1).

Commissioned by the National Science Board, the policymaking body of the National Science Foundation, *Indicators 1976* — the third of an ongoing series — lends itself to the old quip about telling you more than you want to know. But, in the continuing controversy over whether government is doing right by American science, it is far and away the definitive source on what's going on out there in and around the scientific community. And, to the extent that meaningful measures can be made of scientific quality, productivity, and relative international standing, *Indicators* is the official scorebook. What, then, does it tell us?

NIH Head Outlines Role In Health Care — —Page 6

Briefly, the latest findings harmonize with those of *Indicators 1972* and *1974,* which found that US science by and large leads the world, but that the lead is diminishing and that a number of serious problems are quietly festering inside the house of science.

On the cheerier, side, however, *Indicators 1976* confirms earlier findings about public attitudes toward science: While the elders of science seem to find perverse solace in believing that the woes of the community are attributable to a raging anti-science mood on the part of the general public, public opinion pollsters consistently report the public thinks extremely well of science, holds its practitioners in high esteem, and believes science to be a beneficial force in our society.

Let's go on to look at some of the report's major findings:

• National spending for research and development — from government and non-government scources — has in recent years gone up a lot in dollars but has shown little or no increase in purchasing power. Says *Indicators 1976*: "Total R&D expenditures for 1976 in current dollars reached an estimated $38.1 billion, 18 per cent above the 1974 level of $32.3 billion and almost three times the 1960 figure of $13.6 billion. However, the constant dollar rise to $28.5 billion in 1976 was only 2.5 per cent above the 1974 level of $27.8 billion, and 5 per cent below the peak figure of $29.9 billion reached in 1968."

• The drooping dollar figures show up in employment of scientists and engineers. "On a full-time equivalent basis," the report states, "they numbered nearly 531,000 in 1975, up 1 per cent from 1974, but below the high of 558,000 reached in 1969." The drop comes mainly from the decline of the space program, and, to some extent, has since been reversed; in the 1973-75 period, R&D employment went up by 9400.

• Measured as a slice of the gross national product, US R&D has long been on the skids. In 1964, R&D took 2.97 of the GNP; in 1974, the figure dropped to 2.29 per cent, and in 1976, it fell to 2.25. *Indicators* says that "The decline, which began in 1965, is due primarily to a sharp drop in R&D spending from federal sources. The Government's R&D support fell

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In Brief

An expansion of research opportunities for newly graduated scientists ranks high on the planning agenda of the White House science office. Though the President and his science adviser, Frank Press, have expressed concern about the problem, the FY '79 budget offers no specific funds for the job problem, relying instead on efforts to provide a general budgetary uplift for research. But next year, Administration sources tell SGR, an attempt will be made to provide pinpointed relief.

A reviewer of job applications in a government technical agency says that under the heading of "language skills," a recent applicant entered "French and Fortran."

Russell Peterson, newly installed director of the Office of Technology Assessment, is moving to strengthen the authority of the directorship. Peterson has proposed abolition of a system under which OTA provides the salaries for staff members who work directly for individual members of OTA's board of Congressional overseers. He's also proposing abolition of the cumbersome requirement that the board approve all OTA reports.

... Defense And Space Dominate R&D Spending

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from 1.98 per cent of the GNP in 1964 to an estimated 1.19 per cent in 1976. R&D expenditures from non-Federal sources stood at 1.06 per cent of the GNP in 1976, up from the 1964 level of .99 per cent, but have remained stable at between 1.06 and 1.09 per cent in the last 5 years of this period."

• *Indicators* is wordy but uninstructive on the proportion of GNP that other countries devote to R&D. What's noteworthy, however, are its findings of a continuing growth in Japan's proportion of resources for R&D, "while West Germany showed signs of entering a leveling-off period and an eventual decline in 1976." Also, in view of current efforts to depict the Soviet Union as outdistancing the US in research activities, it's to be noted that *Indicators* states, "Although it is difficult to determine precisely how Soviet statistics compare it is thought that they are significantly overestimated relative to US data."

"Knowledge Advancement" Lag

• Putting aside the uncertainties of Soviet R&D expenditures, the US leads the world in the proportion of R&D funds devoted to defense and space — some 65 per cent of total R&D in 1974-75. What's interesting about this in the context of concern over the health of American science is the finding that "The United States, on a percentage basis, allocated a comparatively small share for the advancement of knowledge (4 per cent in 1974-75) while government-funded R&D in other countries was heavily concentrated in this area — particularly Japan (55 per cent in 1974-75) and West Germany (51 per cent in 1975). The report cautions, however, that because of various statistical quirks, the US figures aren't as bad as they look, though it makes clear that the US does trail substantially, percentage-wise, in the advancement-of-knowledge category.

• As a producer of scientific literature, the US retains a long-held leadership position (see table), but in almost every discipline, there has been a slight falloff between 1973 and 1975. *Indicators* concedes that publishing figures are vulnerable to a variety of distortions, such as differing national publishing practices. But as a rough indication of who's publishing how much in major journals, this set of figures is generally considered to be of value. What should be noted, though, is that the decline in the US proportion of worldwide output is no measure of total US output. Rather, as scientific capabilities increase in more and more countries, such as South Korea and Brazil, for example, the US contributions becomes part of an increasingly larger pool.

U.S. share of the world publications[1] from a large sample of influential journals, 1973-75

Field	1973	1974	1975
All fields	39	39	38
Clinical medicine	43	42	43
Biomedical research	39	38	39
Biology	46	46	44
Chemistry	23	22	22
Physics	33	33	32
Earth and space sciences	47	47	45
Engineering and technology	42	42	41
Psychology	76	75	75
Mathematics	48	46	44

[1]As a percentage of 276,000 articles, notes and reviews from the 2,400 influential journals of the *Science Citation Index* Corporate Tapes, 1975, and earlier years.
SOURCE: Computer Horizons, Inc., unpublished data.

Patent Balance Decline

• International trends in the granting of patents are subject to a variety of interpretations, and *Indicators* offers so many of them that it's difficult to extract any clear conclusions from its findings. The US "patent balance" — how many are granted to foreigners versus how many are granted to US nationals — showed a US

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... US Ahead, But Declining in Innovativeness

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decline of about 47 per cent between 1966 and 1975. *Indicators* reports that "The decline was due both to an increasing number of US patents of foreign origin and a leveling off and eventual decline in 1973-75 in the number of foreign patents awarded to US citizens. . . . The number of patents granted to Japanese inventors by the United States in 1975 was more than five times that of 1966."

• Whereas relatively few patents ever show up in marketed products, "innovations" are, by definition, the end product of a long chain, beginning with ideas and culminating in a marketed product. Rummaging through a vast amount of literature on this subject, *Indicators* found that the US is ahead but losing ground, a conclusion based on a survey of 500 technological innovations introduced into the marketplace between 1953 and 1973 in six countries. (Among them: nuclear reactors, double-knit fabrics, electron-beam welding, and cryo-surgery). *Indicators* found that "The United States is ... responsible for the largest percentage of innovations shown to be major. However, from the mid-1950s to the mid-1960s, the US share fell from 80 to 54 per cent of the innovations. This corresponded to an overall increase in the next-ranked United Kingdom innovations from 11 to 24 per cent, and increases of the West German and Japanese shares of innovations of 8 and 7 per cent, respectively. . . . Japan experienced the largest absolute gain over the entire 21-year period although its share of total innovations was only 10 per cent by the early 1970s."

• Technology-intensive products are a big winner for the US in international trade, though this category showed a relative decline in 1976. Nevertheless, until that year, "the technology-intensive product group has been responsible for yielding surpluses and largely covering deficits in trade from specific non-R&D-intensive product groups throughout the period" — from 1960. The recent dropoff is attributed to a cyclical process in which the US establishes and then loses a high-technology lead. "This concept," the report states, "implies that the product structure of US exports must have a continuous infusion of new products in order for the US to maintain a favorable trade position."

• *Indicators* takes no position on whether small is beautiful, but it does find that it is more innovative. "On the basis of a sample of major innovations introduced to the market between 1953 and 1973," it

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Age of doctoral scientists and engineers employed at 4-year colleges and universities, 1973 and 1975

Field of employment	Median age (in years) 1973	Median age (in years) 1975	Percent under 40 years of age 1973	Percent under 40 years of age 1975
Total	40.9	41.3	47	46
Physical scientists	39.1	40.4	54	49
Chemists	39.3	40.9	53	47
Physicists and astronomers	38.9	39.9	55	51
Mathematical scientists	37.8	38.6	59	57
Computer specialists	39.6	38.9	51	55
Environmental scientists[1]	40.1	41.0	47	46
Engineers	40.8	41.7	47	42
Life scientists	41.8	41.6	44	45
Biological scientists	41.0	40.3	47	49
Agricultural scientists	44.7	44.9	34	34
Medical scientists	42.0	42.4	43	42
Psychologists	40.9	41.3	47	46
Social scientists	43.0	42.9	40	40

[1]Includes earth scientists, oceanographers, and atmospheric scientists.

SOURCE: National Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States, 1975,* Detailed Statistical Tables (NSF 77-309), pp. 38-40, and unpublished data.

. . . A Sharp Drop in Founding of R&D Firms

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states, "small firms (up to 1000 employees) were found to produce about four times as many innovations per R&D dollar as medium-size firms (1000 to 10,000 employees) and about 24 times as many as large firms (over 10,000 employees)."

• "Public funds assisted in the development of 24 per cent of the sample innovations produced by the most R&D-intensive group of industries and 36 per cent of those from the reporting non-manufacturing industries."

• However, despite the innovation record compiled by small technical companies, new entries in this corporate category are on the decline (see table). *Indicators* states that their performance "suggests that it is in the Nation's interest that such companies continue to be established," adding that "it is a matter of concern that fewer and fewer small high-technology companies are being founded every year."

New publicly financed small technical companies

Year	Number	Funding (in millions)
1969	204	$349
1970	86	149
1971	73	138
1972	104	194
1973	19	38
1974	4	6
1975 (first 6 months)	0	0

SOURCE: Department of Commerce, *The Role of New Technical Enterprises in the U.S. Economy: A Report of the Commerce Technical Advisory Board to the Secretary of Commerce* (January 1976), p. 15.

Aging Faculties

• As has been noted by many lately, including President Carter (SGR Vol. VII, No. 20), the ranks of academic science are growing old: "The proportion of young — [less than seven years past the Ph.D.] doctoral faculty in doctoral-level science and engineering departments declined from 43 per cent in 1968 to 27 per cent in 1975; over 70 per cent of doctoral faculty in all fields had tenure in 1974." *Indicators* reports (see table).

• "As a fraction of all doctoral degrees, science and engineering degrees declined from 64 per cent in 1965 to 54 per cent in 1975, largely resulting from reduction in the physical sciences." The report continues, "The average annual rate of growth in academic employment of scientists and engineers between 1971 and 1976 was only 2.3 per cent, compared with 6.3 per cent during 1965 through 1971. The greatest growth occurred in the employment of life scientists and social scientists, which together accounted for approximately 54 per cent of the overall increase between 1965 and 1976."

• Finally, in a summary of polls on public attitudes toward science, *Indicators* reports that "In the public's ranking of ten occupations according to prestige, scientists were second only to physicians in 1972, 1974, and 1976. . . . About 70 per cent of the public believed in 1972 and 1976 that science and technology have changed life for the better, and over half believed that they have done more good than harm."

We've cited only some of the major findings from *Science Indicators 1976*. The volume will, because of its abstruse nature, be of interest to only a very small audience. For that audience, however, it is an essential collection of data. What's lacking so far, however, in the *Indicators* series is a summing up and interpretation of these vast accumulations of numbers. The political motive behind *Indicators* is a quest for better understanding — and more generous treatment — on the part of the political community. However, as things now stand with *Indicators*, science is mainly talking to itself. —DSG

Science — Diplomacy Study Published

The House Committee on International Relations has published a three-volume collection, *Science, Technology, and American Diplomacy*, containing 15 case studies of the interaction between S&T and foreign policy. Prepared for the committee by the Congressional Research Service, the big collection covers such topics as nuclear power, ocean minerals, food production, and international health problems.

Copies of the set are available without charge from Bob Stoner, House International Relations Committee, 2170 Rayburn House Office Building, Washington, DC 20515. Telephone: (202) 225-5515.

OTA Moves to New Quarters

After spending its first four years in a squalid, cramped office building that's long been slated for the wrecker's ball, the Office of Technology Assessment has moved into a relatively spacious, renovated building at 600 Pennsylvania Ave. SE, six blocks east of the Capitol. Phone numbers remain the same, except for ordering OTA publications. That's been changed to (202) 546-3590. The address is unchanged: Office of Technology Assessment, Congress of the United States, Washington, DC 20510.

Another Skimpy Budget for British Science

London. Though the British economy is a lot healthier than it was a year ago, the country's scientists nevertheless face at least a few more years of austerity.

This bleak prospect was unveiled in mid-January with the release of the government's expenditure plans for the fiscal years 1978-79 to 1981-82. Overall government spending, adjusted for inflation, will increase by approximately 1 per cent. But the Science Budget — the money allocated for research in universities and by the country's research councils (the equivalent of US granting agencies) — will remain constant throughout the period. By some measures, however, the science figures will actually drop.

The Science Budget will be £256 million in the 1978/79 financial year, beginning in April, and £252 million in 1981/82. The coming year's budget is inflated by £4½ million made available for special building projects under a government scheme to aid the ailing construction industry. The only consolation is that last year's White Paper on forthcoming expenditure fixed the budget at £4 million a year lower than this year's report. (All figures are in 1977 prices.)

Down Since 1972/73

The true collapse in government spending comes clearer when you look back to 1972/73, when the Science Budget was £288 million. This plummeted to £232 million in 1975/76. Hidden in this reduction in the total spending of the five research councils is a massive reduction in the amount spent on the work of the Science Research Council (SRC), which covers all areas of fundamental research not covered by the more specialized Agricultural, Medical, Natural Environment, and Social Science Research councils. It is the SRC that supports the big accelerators, the expensive telescopes, and scientific satellites, as well as most of the universities' engineering research.

Over the past two years the SRC's budget has been cut by 2 per cent a year. And if there is no increase in the Science Budget over the next four years there could be a further reduction of 1.7 per cent a year in the SRC's spending as the other research councils increase their budgets. Many of the country's scientists acknowledge that the SRC, with its emphasis on big science and expensive projects, was taking too much of the Science Budget; but they now feel that the cuts have gone too far. Thus , when the Advisory Board for the Research Councils (ABRC) — the committee of top scientists that advises the Secretary of State for Education and Science as to how the Science Budget should be shared out among the research councils — came to allocate the extra £4 million added to next year's budget, there was little objection to the SRC getting more than its "fair share" of the money. (The chairman of the Social Science Research Council was so convinced of the need for more money for pure science that he didn't even seek a share of the £4 million).

The feelings of the scientific community about the poor outlook for science were summed up by Professor Sir Fred Stewart, chairman of the ABRC. He warned that the predicted level of spending would impose "serious constraints on the maintenance of a scientific capability" in Britain. The reduction in the SRC's budget amounts to a fall of £2 million a year. (The SRC will receive 54.7 per cent of the Science Budget this year). These cuts have forced the early closure of the two national accelerators, Nina and Nimrod, and have slowed down the work on the Northern Hemisphere Observatory. And the SRC isn't even bothering to consider further big science projects beyond its present program.

The Oil Bonus

Stewart wants the Science Budget to be increased by 3-5 per cent over the next few years. This money should, he says, come from the growing North Sea oil wealth so that the country's scientists can work on the ideas that will be needed in 20 years when the oil begins to run out and something else has to take its place.

Thus science joins just about every other part of the community in seeking a handout from North Sea oil revenues. So far it looks as if the first few years' extra wealth will be diverted into tax cuts, but the government is now preparing a policy paper on what to do with this windfall.

Stewart admitted that the country's scientists have not specifically put in a claim for a share of the wealth. Had the ABRC done so, it might have found it difficult to justify Stewart's claim that the work of the research councils will provide the energy technologies that will take over when North Sea oil runs out.

The SRC may be spending more money on engineering, with a program on marine technology growing rapidly, but it has been slow in responding to the energy crisis. Its efforts to encourage energy R&D have been half-hearted. Most of the work in this area is by the Department of Energy, which, under the influence of Walter Marshall, diverted much of the Energy R&D money to the UK Atomic Energy Authority's Harwell establishment. Just how this work will fare now that Marshall has been sacked (SGR Vol. VII, No. 13) remains to be seen, but there is little chance of the SRC quickly taking a more important role in the country's energy R&D. —MK

Research vs. Health Care: What Role for NIH?

With containment of health-care costs and cleansing of the environment holding high priorities in federal planning, a lot of policymakers in Washington are casting aggressive looks at the vast scientific resources of the National Institutes of Health. Why, they argue, can't NIH's research abilities be harnessed to the attainment of these objectives?

The answer from Bethesda, Md., of course, is that, worthy as these goals are, NIH has other responsibilities and, in addition, is not well suited for what are essentially monitoring and regulatory tasks.

The argument, however, runs into oldtime political insistence for quick results, which remains strong, despite Jimmy Carter's expressions of concern about the state of basic research (SGR Vol. VIII, No. 2).

In response to this situation, NIH is bending, but just a bit, as is evidenced by a policy paper to be issued later this month by NIH Director Donald Fredrickson. Titled "The Responsibilities of NIH at the Research/Health Care Interface," the paper seeks a balance between (1) "a critical assumption: that broadened responsibilities will *not* (original italics) draw NIH into activities inappropriate to its primary research mission, such as regulation, direct health care, or authoritarian establishment of health-care standards" and (2) the fact that "Congressional and other observers look increasingly to the research community for help" in responding to "major weaknesses in the Nation's health-care system."

Building On Present Procedures

The NIH response to this navigational problem is a cautious course that calls for "systemizing, formalizing, and extending *present* (italics supplied) procedures for handling research information" — the object being to "make helpful contributions in several areas." By doing so, Fredrickson's plan states, NIH "can assist the practicing community to gain maximum direct benefit from national research programs . . . provide a basis for standards setting by the health-care community . . . act as a further safeguard against premature or lagging transfer of new research knowledge into health practice . . . [and] assure that possible cost, ethical or other social impacts of new research findings are taken into account in research community recommendations."

However, for those who fear that the activities proposed by Fredrickson will entail a substantial diversion of resources from NIH's research programs, it turns out that his prescription is based mainly on intensifying present efforts.

The plan states that "The NIH proposal would require each NIH Institute to formalize and extend existing procedures — or to devise new ones — to assure that pertinent information in its research area is processed as completely as possible for effective transfer to the health-care community. Knowledgeable members of the research community would be expected to seek a 'technical consensus' on these points: the clinical significance of new findings; whether validation for efficacy and safety has been adequate, and, if not, what more needs to be done; whether cost, ethical or other social impacts need to be identified as points for caution when formal recommendations are made; whether the technical complexity of the new findings suggests the need for further demonstration of feasibilities in local community settings; whether recommendations are phrased for ready understanding and acceptance by health practitioners, and include all appropriate cautions."

Following are other significant sections from a summary of the proposal that was prepared in Fredrickson's office:

• "Each Institute would be free to tailor its 'technical consensus' and related procedures to specific problems and competencies in its research area; and to draw upon representatives of government and non-government lay and professional groups when their contributions might be useful.

• "To provide guidance, central support and coordination, an office established in the Office of the Director, NIH, would maintain essential links among Institute efforts, the Director, NIH, the Office of the

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New Saccharin Study Set

The saccharin issue is back again, this time in the form of a $1.3 -million, 18-month bladder cancer study to be jointly conducted by the Food and Drug Administration and the National Cancer Institute.

Though not specifically mandated in last fall's 18-month Congressional moratorium on regulatory action against the artificial sweetener, the costly study harmonizes with that edict. Specifically, however, it stems from a recommendation by an FDA-NCI special task force which recommended a large, population-based study to determine whether the cancer effect found in animals is also related to human bladder cancer.

The study, which will begin in March, will be based on interviews with 3000 bladder cancer patients and 6000 randomly chosen individuals in New Jersey, Connecticut, Iowa, New Mexico, Utah and the metropolitan areas of Detroit, San Francisco-Oakland, New Orleans, and Atlanta.

...Plan Calls for Modest Additional Costs

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Assistant Secretary for Health, and health care agencies. It would assist in the development of effective procedures common to all Institutes, and in evaluation of the success of transfer processes; it would also have available the requisite competence in science writing to assist Institutes in 'translation' and 'packaging' of information for transfer across the interface; and would coordinate these activities with the communications role of the National Library of Medicine.

• "The NIH proposal also recommends the establishment of a consensus-building mechanism on the health care side of the interface, to include representatives of major participants in health care delivery, financing, and regulation. If echelons above NIH should decide to create such a mechanism, these, in the view of the NIH, would be useful functions to assign it:

• "Responsibility for assessing research community recommendations for new diagnostic, therapeutic or preventive measures in terms of health care feasibility (including costs and technical complexity); and for providing authoritative 'feed back' to the research community on those or related matters.

"Getting Out the Word"

• "Principal responsibility for 'getting out the word' to individual members of the health care community on useful new information from research."

The summary states that "conspicuous strengths exist upon which NIH may draw: The structuring of NIH Institutes, their associated National Advisory bodies, and the network of collaborating investigators and research institutions within the research community provides an adequate framework for addressing issues. Also, medical school teaching hospitals and main disease research centers currently represent the most effective transfer points for the movement of research knowledge into health practice. Their strengths and expertise must underpin new processes. The archival and communication resources of the National Library of Medicine are major assets."

It adds that "the new 'transfer' processes would not replace or interface with existing processes for research information dissemination, which would continue to depend mainly on publication in the open literature. Rather, they would assure that the most 'useful ' part of this information flow goes through an identification/validation/recommendation process to reinforce its ready acceptance in health practice."

As for the costs — they're relatively modest, amounting to first-year expenditures of an estimated $669,000.

Given the nagging belief among many politicians that NIH is somehow deficient in getting its research results to the patient, the response offered by Fredrickson is probably the least that NIH can offer to its Congressional critics. In fact, several Senators who are influential in biomedical affairs, Edward Kennedy among them, introduced legislation January 31 (see page 8) to establish, "parallel to the National Institutes of Health," a National Institutes of Health Care Research.

Thus, the relationship between basic biomedical research and health care is warming up as a political issue, and is likely to get even more controversial as health care costs increase and the biomedical research community simultaneously seeks to avoid dilution of its budgets and attention.

Freedom of Information Act

Do you want to use the Freedom of Information Act to obtain material that is not routinely made public by federal agencies? Simple instructions on the employment of this effective tool are available from a Washington-based public-interest organization: Freedom of Information Clearing House, PO Box 19367, Washington, DC 20036. Request pamphlet titled, "The Freedom of Information Act: What It Is And How To Use It," and enclose 10 cents to cover costs.

Health Care Research Institute Proposed

A bill to establish a new government agency, the National Institutes for Health Care Research (S. 2466), was introduced January 31 by four influential Senators:

Edward Kennedy (D-Mass.), chairman of the Health and Scientific Research subcommittee; Richard Schweiker, of Pennsylvania, the subcommittee's ranking Republican; Harrison Williams (D-NJ), chairman of the parent Human Resources Committee, and Jacob Javits, of New York, the Committee's top Republican.

The bill grows out of widespread concern over growing health-care costs and growing dissatisfaction with federal efforts to evaluate the costs and efficacy of medical care.

As outlined in a floor statement by Kennedy, who is the principal figure behind the bill, the proposed NIHCR would have broad responsibilities to study and assemble data on health-care activities. "Its function," Kennedy said, "would be to plan and undertake a broad series of research activities aimed at improving our health-care delivery system. These include the collection and analysis of health statistics, the conduct of epidemiological research in the health area, the support of health services research, and the evaluation of medical technologies.

"In the past," Kennedy continued, "the Federal Government has invested meagerly, if at all, in these activities. . ."

To be established as a separate agency within the Public Health Service, the NIHCR would contain the following parts:

A National Center for the Evaluation of Medical Technologies "to assess cost and effectiveness of medical practices and procedures."

A National Institute for Health Statistics and Epidemiology that would "expand, redirect and rename" the existing National Center for Health Statistics.

A National Institute for Health Policy Research that would do the same for the present National Center for Health Statistics.

Science—Religion Conference

The World Council of Churches announces that it's concluded arrangements with MIT to hold a World Conference on Faith, Science and the Future on the Cambridge, Mass., campus, July 12-24, 1979. The Council says that 500 scientists and theologians will attend and the purpose is to "look for the meaning of faith in a world in which science and technology are transforming forces that both liberate and destroy persons and human values." David Rose, professor of nuclear engineering at MIT, is one of the organizers of the conference, along with Paul Albrecht, director of the Council's Church and Society Section, Geneva, Switzerland.

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